12

MANPOWER AND PERSONNEL LABORATORY
San Diego, California

MPL TN 84-3

SEPTEMBER 1984

VALIDATION OF THE ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) AND THE ENGLISH DIAGNOSTIC TEST (EDT) FOR PERFORMANCE IN BASIC JOURNALIST (JO) "A" SCHOOL

STEPHANIE BOOTH-KEWLEY

A LABORATORY OF THE NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER

MANPOWER & PERSONNEL LABORATORY
NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER
SAN DIEGO, CALIFORNIA 92152

24 September 1984

MEMORANDUM FOR DISTRIBUTION

Subj: Manpower and Personnel Laboratory Technical Note 84-3

Encl: (1) MPL TN 84-3, "Validation of Armed Services Vocational Aptitude Battery (ASVAB) and the English Diagnostic Test (EDT) for Performance in Basic Journalist (JO) School," by Stephanie Booth-Kewley

1. Enclosure (1) describes a predictive validation study conducted to evaluate the ASVAB composite currently used to select students for JO "A" school. The study also evaluated the contribution of the English Diagnostic Test to the validity of the ASVAB selection criteria. The ASVAB general technical composite was found to predict JO school performance better than the operational clerical composite; consequently, it was recommended that the general technical composite be adopted. This change was implemented by the Naval Military Personnel Command on 1 July 1984. Although the English Diagnostic Test made a small, significant contribution to the clerical composite's validity, this contribution was not large enough to justify the expense of adding the test to the JO selection criteria.

2. The work reported in enclosure (1) is part of a continuing program to evaluate the effectiveness of measures used in the assignment of recruits to Navy schools and to establish standards for school entry (see also NPRDC TR 84-22; MPL TN 84-1, 84-2).

3. The report is being distributed to document work of interest to Navy offices and researchers concerned with similar operational and methodological issues.

Martin F. Wiskoff

MARTIN F. WISKOFF
Director
Manpower and Personnel Laboratory

Distribution list follows.

Distribution List

Chief of Naval Operations (OP-11), (OP-13)
Chief of Naval Education and Training (Code 00A), (Code 20)
Chief of Naval Technical Training (N-6)
Commander, Naval Military Personnel Command (NMPC-48)
Commanding Officer, Naval Education and Training Program (Code IPD)
(Personnel & Training Research)
Commanding Officer, Naval Technical Training Center, Corry Station (Code 101B)
Commander, Army Research Institute for the Behavioral and Social Sciences,
Alexandria (PERI-ASL), (PERI-ZT)
Commander, Air Force Human Resources Laboratory, Brooks Air Force Base
(Manpower & Personnel Division)
Defense Technical Information Center (DDA) (12)

This study was conducted within work unit WRB2708 (Armed Services Vocational Aptitude Battery, document number NO01184WRB2708) and sponsored by the Chief of Naval Operations (OP-135).

MPL Technical Note 84-3 September 1984

VALIDATION OF ARMED SERVICES VOCATIONAL APTITUDE BATTERY (ASVAB) AND THE ENGLISH DIAGNOSTIC TEST (EDT) FOR PERFORMANCE IN BASIC JOURNALIST (JO) "A" SCHOOL

Stephanie Booth-Kewley

Reviewed by
James R. McBride
Personnel Systems Department

Released by
Martin F. Wiskoff
Manpower and Personnel Laboratory

Navy Personnel Research and Development Center
San Diego, California 92152

SUMMARY

Problem

The Basic Journalist (JO) Class "A" school, a joint-services Department of Defense training course, has experienced substantial attrition in recent years. The attrition rate for Navy personnel has exceeded 15 percent every year since 1979. Concern over this high attrition rate led the Navy Personnel Research and Development Center to examine the validity of the Armed Services Vocational Aptitude Battery (ASVAB) composite that is used to determine eligibility for school assignment, as well as the validity of the English Diagnostic Test (EDT), which is used by the school to identify students requiring remedial English training.

Objective

The first objective of this study was to evaluate the clerical composite, which is the ASVAB composite used by the Navy to select students for JO school, in comparison to the general technical composite and other alternate ASVAB composites. The second objective was to evaluate the contribution of the EDT to the validity of the clerical and general technical selector composites.

Approach

The sample consisted of 179 Navy enlisted personnel who enrolled in JO "A" school between October 1980 and December 1983, and who had been tested on ASVAB Forms 8, 9, or 10. The predictor variables were the 10 ASVAB tests and the verbal measure of ASVAB (VE), the 11 ASVAB composites in use by the Navy, 25 experimental composites, and the EDT. Criterion measures were final school grade (FSG), class standing (CLSTAND), and final status (GRAD/DROP) in the JO course.

Means and standard deviations of the three school performance criteria were computed for (a) the total sample, (b) students who passed the EDT, (c) students who failed the EDT, (d) males, and (e) females.

Correlations were computed between the predictors and the criteria and then corrected for range restriction. Multiple correlations were computed between each criterion measure and (a) the ASVAB JO selector composites used by each of the military services, coupled with the EDT, and (b) the general technical composite coupled with individual ASVAB tests. Expectancy tables were constructed for the clerical and the general technical composites, using GRAD/DROP as the criterion.

Results

The general technical composite predicted all three criterion measures better than the clerical composite, with significant differences for FSG and GRAD/DROP. The uncorrected correlations of the general technical composite with FSG, CLSTAND, and GRAD/DROP were .43, -.42, and .45 respectively; the corresponding values for the clerical composite were .26, -.30, and .28.

For all criteria, the EDT substantially increased validity when combined with the clerical or the skilled technical composites. The EDT did not, however, contribute significantly to the validity of the general technical composite for predicting CLSTAND, and it made only small additions to the validity for predicting FSG and GRAD/DROP. The multiple correlations before and after EDT was added were .46 and .51 for FSG and .48 and .52 for GRAD/DROP. Although these increases in explained variance were statistically significant, their practical significance is doubtful.

Conclusions

1. The ASVAB general technical composite is more valid for predicting the performance of Navy students in JO school than is the currently used ASVAB clerical composite.

2. None of the other ASVAB composites is significantly more valid than the general technical composite for predicting JO school performance.

3. The EDT makes a small but practically insignificant contribution to the validity of the general technical composite.

Recommendations

1. The ASVAB general technical composite, rather than the currently used clerical composite, should be adopted to select Navy students for JO school.

2. The EDT should not be added to the Navy JO school selection criteria.

CONTENTS

TABLES

INTRODUCTION

Problem

Attrition in the Basic Journalist (JO) Class "A" school, a joint-services Department of Defense training course, has been substantial in recent years. Academic attrition of Navy personnel has consistently exceeded 15 percent--the established management attrition limit--from 1979 to the present. This high attrition has occurred even though all JO students are required to take a test of basic English skills, the English Diagnostic Test (EDT), upon arrival at the school, and those who fail are required to complete a 3-week refresher English course before beginning regular JO training.

Background

The measure used to select enlistees for JO training is derived from the Armed Services Vocational Aptitude Battery (ASVAB), the instrument used by the military services to select and classify enlisted personnel. The operational version of the ASVAB, Forms 8, 9, and 10, consists of 10 cognitive tests (described in Table 1) and a verbal measure (VE), the sum of the word knowledge and paragraph comprehension tests. Several ASVAB composites--combinations of certain ASVAB tests--are used by the military to determine eligibility for assignment to specific technical schools or to on-the-job training.

The ASVAB 8, 9, and 10 selector composite that is currently used by the Navy to determine qualification for the JO school is the clerical composite (CLER); it consists of the sum of the verbal measure (VE), the numerical operations test (NO), and the coding speed test (CS) (VE + NO + CS). In contrast, the Air Force and the Marine Corps use a selector composite that the Navy calls the general technical composite (GT). It consists of VE and the arithmetic reasoning test (AR) (VE + AR). The Army uses the skilled technical composite (ST), a composite that is not part of the Navy personnel selection system; it consists of VE combined with the general science (GS), mathematics knowledge (MK), and mechanical comprehension tests (MC) (VE + MK + MC + GS). Table 2 presents the ASVAB composites used by each of the military services to select students for JO "A" school.

Concern over the high attrition of JO "A" school students led Parks, Mathews, and Ree (1983) to investigate the predictive validity of the ASVAB 8, 9, and 10 composites used for selecting JO students, and to assess the contribution of the EDT to the validity of the ASVAB JO selector composites. For their sample of personnel from all services combined, (N = 228), Parks et al. (1983) found the GT composite to be substantially more predictive of final grades in JO school than either the CLER or the ST composite. Interestingly, they found that the EDT significantly increases the validity achieved by either the CLER or the ST composite alone, but does not significantly increase that of the GT composite. Furthermore, their results showed that the GT, by itself, predicts JO school performance better than either the EDT and the CLER combined, or the EDT and the ST composite combined. The results for the Navy students only (N = 48) were the same, except that the GT composite predicted school performance on-

ly slightly better than did the CLER and ST composites. In addition, for this sample the EDT was found to make a significant contribution to the validity of the GT composite. Based on their findings, Parks et al. (1983) recommended that the GT composite be used by all of the military services to select students for JO "A" school.

Objective

The first objective of this study was to evaluate the CLER composite, used by the Navy to select students for JO school, in comparison to the GT composite and other alternate ASVAB composites. The second objective was to evaluate the contribution of the EDT to the validity of the CLER and GT selector composites.

Table 1

Predictor Variables from ASVAB Forms 8, 9, and 10

Predictor Variable	Abbreviation	Description
	ASVAB Tests[a]	
General science	GS	A 25-item test of knowledge of the physical (13 items) and biological (12 items) sciences--11 minutes.
Arithmetic reasoning	AR	A 30-item test of ability to solve arithmetic word problems--36 minutes.
Word knowledge	WK	A 35-item test of knowledge of vocabulary, using words embedded in sentences (11 items) and synonyms (24 items)--11 minutes.
Paragraph comprehension	PC	A 15-item test of reading comprehension--13 minutes.
Numerical operations	NO	A 50-item speeded test of ability to add, subtract, multiply, and divide one-digit and two-digit numbers--3 minutes.
Coding speed	CS	An 84-item speeded test of ability to recognize numbers associated with words from a table--7 minutes.
Auto and shop information	AS	A 25-item test of knowledge of automobiles, shop practices, and use of tools--11 minutes.
Mathematics knowledge	MK	A 25-item test of knowledge of algebra, geometry, fractions, decimals, and exponents--24 minutes.

[a]Reported as Navy Standard Scores having a mean of about 50 and a standard deviation of 10 for an unrestricted recruit population.

Table 1 (Continued)

Predictor Variable	Abbreviation	Description
Mechanical comprehension	MC	A 25-item test of knowledge of mechanical and physical principles --19 minutes.
Electronics information	EI	A 20-item test of knowledge of electronics, radio, and electrical principles and information--9 minutes.
Verbal	VE	A composite consisting of WK + PC.

ASVAB Selector Composites Used by Military Services

All Services		
AR+NO/2+VE	AFQT	Armed Forces Qualification Test
VE+AR	GT	General Technical
AR+MK+EI+GS	ELEC	Electronics
VE+NO+CS	CLER/A	Clerical (Used as Administrative Composite (A) by Air Force)
Navy		
VE+MC+AS	MECH	Mechanical
VE+MC	AM	Selector for Aviation Structural Mechanic School
AR+2MK+GS	BE/E[b]	Selector for Basic Electricity and Electronics School
MK+AS	BT/EN/MM	Selector for Boiler Technician, Engineman, and Machinist's Mate Schools
VE+AR+NO+CS	CT	Selector for Communications Technician (Interpreter) School
VE+MK+GS	HM	Selector for Hospitalman School

[b]Not all BE/E schools use the "BE/E" composite as the operational selector, nor is this selector used only by BE/E schools--a number of "A" schools use it as well.

Table 1 (Continued)

Predictor Variable	Abbreviation	Description
ASVAB Selector Composites Used by Military Services (Continued)		
AR+MC+AS	MR	Selector for Machinery Repairman School
VE+AR+MC	SUB	Selector for Submarine School
MK+EI+GS	ELEC Comp[c]	Component of Electronics
Air Force		
MC+GS+2AS	M	Mechanical
Army		
CS+AR+MC+AS	CO	Combat
CS+AR+MC+MK	FA	Field Artillery
NO+VE+MC+AS	OF	Operators and Food
NO+CS+VE+AS	SC	Surveillance and Communications
MK+EI+GS+AS	GM	General Maintenance
NO+EI+MC+AS	MM	Mechanical Maintenance
VE+MK+MC+GS	ST	Skilled Technical
Experimental ASVAB Composites		
NO+VE+AS	AR+EI+MC	
AR+VE+AS	VE+MK	
WK+AR	MK+EI	
WK+MC+AS	MK+MC+EI	
WK+NO+CS	AR+MK	
AR+MC	AR+EI+GS	
CS+VE+AR	AR+MK+AS	
MK+EI+AS	MC+MK+AS	
AR+MK+MC		

[c]Most of the Navy schools that use the electronics composite use the following dual cutoffs: MK + EI + GS = 156 +AR = 218. MK + EI + GS is never used by itself as a school selector.

Table 2

ASVAB 8, 9, and 10 Composites Used by the Military Services
For Selecting JO School Students

Service	Composite	Tests Included
Navy	Clerical (CLER)	VE + NO + CS
Air Force	General technical (GT)	VE + AR
Marine Corps	General technical (GT)	VE + AR
Army	Skilled technical (ST)	VE + MK + MC + GS

APPROACH

Sample

The original sample consisted of 187 Navy enlisted personnel who were enrolled in JO "A" school between October 1980 and December 1983, and who had been tested on ASVAB Forms 8, 9, or 10. Data for eight subjects who were dropped from the course for nonacademic causes (e.g., medical problems), which ASVAB tests are not intended to predict, were deleted from the sample. The resulting sample consisted of 179 students, but sample sizes for some analyses were smaller because of missing data on particular variables.

Predictors

The predictor variables were the 10 ASVAB 8, 9, and 10 tests, the ASVAB verbal measure (VE), the 11 ASVAB composites currently used by the Navy, and 25 experimental composites (see Table 1). In addition, the EDT, a 64-item paper-and-pencil instrument designed to assess basic English skills, served as a predictor.

Criteria

Criteria of JO "A" school performance were:

1. Final school grade (FSG): The average of scores obtained by the student on all class-administered tests.

2. Class standing (CLSTAND): The student's ranking, as determined by FSG, in relation to his or her class.

3. Final status (GRAD/DROP): A designation of whether the student graduated or dropped from the course due to academic difficulties. Drops were coded 1; graduates were coded 2. FSG and CLSTAND were not available for students who dropped the course.

Data Analyses

Descriptive Statistics

Means and standard deviations of the three school performance criterion variables were computed for (a) the total sample, (b) students who passed the EDT (scored 40 or above), (c) students who failed the EDT (scored less than 40), (d) males, and (e) females. These calculations were performed separately so that any potentially relevant school performance differences could be detected.

Bivariate Correlations

Pearson product-moment correlations of the ASVAB variables (tests and composites) and the EDT were computed with FSG, CLSTAND, and GRAD/DROP, so that the validity of alternate ASVAB measures and the EDT could be compared with that of the current Navy JO selector, the CLER composite. The differences between these correlations were tested for significance (Cohen & Cohen, 1975, p. 53). The correlation coefficients were then corrected for restriction in range, to reflect the values that would be obtained for a sample representing the full range of ability of Navy recruits. The corrections were made using Lawley's technique (1943), which adjusts for range restriction resulting from multivariate selection. The population statistics used for the corrections were based on a group of 66,459 recruits who entered the Navy from July 1981 though May 1982.

Multiple Correlations

Multiple correlation coefficients (Rs) were calculated using a forward hierarchical procedure, with the ASVAB selector composite of interest (e.g., the CLER composite) entered into the equation first, followed by the EDT. This procedure was repeated with each of the three criteria serving as dependent variables, and for each of the service's JO selector composites--the CLER, GT, and ST composites. These analyses were performed to determine whether the EDT makes a significant contribution to the predictive ability of the ASVAB JO selector composites.

Multiple correlations were also performed using a standard stepwise regression procedure (forward selection), in which the GT composite and the individual ASVAB tests were entered as predictors. (The VE score was used instead of the WK and PC scores separately.) These analyses were performed to determine whether any of the ASVAB tests not already included in the GT composite add signficantly to its predictive ability.

Expectancy Analyses

Expectancy tables were constructed for the current and proposed Navy JO selectors--the CLER and the GT composites--using GRAD/DROP as the criterion. The population values used for the analysis were based on the sample of 66,459 recruits that was used for correcting validity coefficients for range restriction.

RESULTS

Descriptive Statistics

The means and standard deviations of the three school performance criteria, FSG, CLSTAND, and GRAD/DROP, are presented in Table 3.[1] These statistics are shown for (a) all students, (b) students who passed the EDT, (c) students who failed the EDT, (d) males, and (e) females. As shown, the school performance of students who passed the EDT tended to be better than that of those who failed, suggesting that the EDT has some validity for predicting JO training performance. An inspection of the mean criterion scores computed for male and female students separately revealed only trivial performance differences.

Bivariate Correlations

Pearson product-moment correlations of the ASVAB predictors and EDT with FSG, CLSTAND, AND GRAD/DROP are presented in Table 4. Uncorrected correlations that were found to be significantly higher than those obtained for the operational CLER selector composite are marked in the table with asterisks. Some correlations marked with asterisks are lower than some unmarked correlations because the significance test takes into consideration the intercorrelations of the predictors being compared and not just the differences between the uncorrected correlation coefficients.

For all three measures of school performance, the general technical composite was found to be more valid than the clerical composite. The corrected correlations of the general technical composite with FSG, CLSTAND, and GRAD/DROP are .52, -.55, and .54 respectively; the corresponding values for the clerical composite are .41, -.51, and .39. (Negative correlations were expected for the CLSTAND criterion, since high ability students were expected to achieve numerically lower class standing scores; for example, the top student in the class would receive a CLSTAND score of 1.) These differences are significant for FSG and for GRAD/DROP ($p < .05$), but not for CLSTAND.

Only one other ASVAB composite, WK + AR, appeared to predict all three school performance measures as well or better than the GT composite. However, the differences were not significant.

Table 4 clearly indicates that for all three criterion measures, the EDT is more valid than the CLER composite. These differences were statistically significant for FSG and for GRAD/DROP but not for CLSTAND. For both FSG and GRAD/DROP, the EDT is also more valid than the majority of the ASVAB predictors.

It is also apparent from Table 4 that the EDT predicts FSG and GRAD/DROP about as well as the GT composite. Although the GT composite appeared slightly more valid than the EDT for predicting CLSTAND, this difference was not signif-

---

[1]All tables referred to in Results may be found at the end of the section, starting on page 11.

icant. The corrected correlations of the EDT with FSG, CLSTAND, and GRAD/DROP are .53, -.47, and .51 respectively; the corrected correlations of the general technical composite are .52, -.55, and .54.

Multiple Correlations

The results of the hierarchical multiple regression, in which the ASVAB JO school selector composite was entered into the equation first, followed by the EDT, are shown in Table 5. For each of the three criteria, the GT composite combined with the EDT resulted in a higher multiple correlation coefficient than any of the other measures or combinations of measures used. For both the FSG and GRAD/DROP criteria, EDT significantly increased the multiple correlation coefficient when combined with any of the three JO school selectors used by the services. For the CLSTAND criterion, however, the EDT made a significant contribution to the multiple correlation coefficient when combined with either the CLER or ST composites, but not when combined with the GT.

For each of the three criterion measures, the predictive validity of the GT composite alone is about the same as that of the CLER composite and the EDT combined, or of the ST composite and the EDT combined. The multiple correlation coefficients for predicting FSG, CLSTAND, and GRAD/DROP are .46, .42, and .48 respectively for the GT composite alone, .47, .43, and .48 for the CLER composite and the EDT combined, and .49, .42, and .49 for the ST composite and the EDT combined.

Table 6 shows the results of the stepwise multiple regression analyses, with the GT composite and the ASVAB tests entered as predictors and with each of the three school performance measures serving as dependent variables. For both FSG and CLSTAND, the electronics information (EI) and numerical operations (NO) tests significantly increased the multiple correlation coefficients over the value obtained with only the GT composite in the equation. For the GRAD/DROP criterion, two different ASVAB tests--mechanical comprehension (MC) and general science (GS)--significantly increased the multiple correlation over that obtained for the GT composite alone.

Although the addition of the individual ASVAB tests to the regression equations increased the multiple correlation coefficients to a statistically significant extent, the increases were actually quite modest. This was particularly true for the GRAD/DROP measure, for which the multiple correlation coefficient increased from .45 to .47 when MC was added to the GT composite, and from .47 to .49 when GS was added to the equation containing the GT composite and MC.

Correlation coefficients of five ASVAB composites composed of the tests revealed to be the most promising by the multiple regression analyses were computed with the three school performance criteria; they are presented in Table 7. These correlations were computed to determine whether any ASVAB composites predicted JO training performance better than the GT composite.

Two findings of interest emerged from this analysis. First, none of the promising alternate composites is significantly more valid than the GT composite. Second, a comparison of the multiple correlation coefficients in Ta-

ble 6 with the corresponding simple correlations--those obtained for the unit-weighted composites made up of the same ASVAB tests--in Table 7 showed that for FSG and for CLSTAND, the unit-weighted composites are just as valid as the equations using exact regression weights. This was not the case, however, for the GRAD/DROP measure, for which the correlations of the unit-weighted composites VE + AR + MC and VE + AR + MC + GS are .36 and .38, respectively, and the corresponding multiple correlations are .47 and .49. But even if a simple correlation of .49 had been found for the unit-weighted VE + AR + MC + GS composite, it would still not have been significantly greater than the correlation of .45 found between the GT composite and GRAD/DROP.

Expectancy Analyses

Because the results of the correlational analyses revealed a clear tendency for the GT composite to predict performance in JO "A" school better than the operational Navy CLER composite, expectancy tables for these two composites were constructed; they are shown in Table 8. In each table, data are presented for the current cutting score (165), or for the corresponding cutting score for the proposed composite (112), as well as for a number of cutting scores above and below the current one. The tables show the number of recruits, per 1000, that would be expected to qualify for the school, and the number of graduates and academic drops expected for each cutting score.

As shown, using the GT composite with a cutting score of 112 would qualify about the same number of recruits (37%) as the CLER composite does (38%) and would result in 36 more graduates and 46 fewer drops per 1000. The graduation rate would increase from 77 to 89 percent; conversely, the academic attrition rate would decrease from 23 to 11 percent.

In contrast, if the ASVAB clerical composite were retained with the current cutting score of 165, to obtain an academic drop rate as low as that associated with GT = 112, the cutting score of the CLER composite would have to be raised to 180. This would result in a 12 percent academic drop rate, but it would also drastically reduce the percentage of recruits that would be eligible for the school, from 38 to 10 percent.

Table 3

Means and Standard Deviations of Research Subjects
By School Performance Criterion

Sample Group	FSG (N = 138) Mean	FSG (N = 138) SD	CLSTAND (N = 137) Mean	CLSTAND (N = 137) SD	GRAD/DROP (N = 179) Mean	GRAD/DROP (N = 179) SD
All students	82.09	4.24	14.88	9.75	1.77	.43
Students who passed the EDT (scored 40 or greater)	82.76	4.08	13.63	9.64	1.83	.37
Students who failed the EDT (scored less than 40)	79.72	2.10	17.61	7.54	1.45	.50
Males	82.03	4.29	14.85	9.73	1.75	.43
Females	82.21	4.19	14.92	9.90	1.79	.41

Table 4

Correlations of EDT, ASVAB Tests, and ASVAB Selector Composites With Three School Performance Criteria

	FSG (N = 138)		CLSTAND (N = 137)		GRAD/DROP (N = 179)	
Predictor	r_u	r_c	r_u	r_c	r_u	r_c
English Diagnostic Test (EDT)	45*	53	-36	-47	44*	51
ASVAB Tests						
GS	32	41	-31	-41	34	43
AR	43	51	-41	-52	37	41
WK	30	43	-28	-41	44*	53
PC	20	24	-26	-35	35	45
NO	18	33	-24	-43	00	15
CS	03	22	-04	-28	07	21
AS	25	20	-23	-17	22	19
MK	37	47	-34	-46	40	45
MC	33	37	-32	-36	15	20
EI	37	41	-38	-39	30	44
VE	29	37	-30	-42	44*	55
Navy Composites in Use						
VE+AR (GT)	43*	52	-42	-55	45*	54
VE+MC+AS	35	37	-34	-37	28	34
AR+MK+EI+GS	46*	56	-45	-56	43	51
VE+NO+CS (CLER)	26	41	-30	-51	28	39
VE+MC	36	44	-36	-45	29	40
AR+2MK+GS	43*	54	-40	-54	43	50
MK+AS	37	41	-36	-39	36	40
VE+AR+NO+CS	40**	50	-42**	-58	39**	45
VE+MK+GS	41	50	-39	-52	46*	56
AR+MC+AS	40	43	-38	-42	29	32
VE+AR+MC	43	52	-42	-53	36	45
MK+EI+GS	43	52	-42	-52	41	50

Note. Decimals have been omitted. Coefficients marked with asterisks are significantly higher than those obtained for the operational JO selector composite (CLER): *$p < .05$; **$p < .01$.

Table 4 (Continued)

Predictor	FSG (N = 138) r_u	FSG (N = 138) r_c	CLSTAND (N = 137) r_u	CLSTAND (N = 137) r_c	GRAD/DROP (N = 179) r_u	GRAD/DROP (N = 179) r_c
Experimental Composites						
MC+GS+2AS	33	34	-32	-32	26	29
CS+AR+MC+AS	41	46	-39	-47	31	36
CS+AR+MC+MK	44*	53	-42	-55	36	43
NO+VE+MC+AS	38	46	-39	-49	28	37
NO+CS+VE+AS	34	43	-36	-50	33	41
MK+EI+GS+AS	40	47	-39	-45	38	45
NO+EI+MC+AS	39	46	-40	-47	25	31
VE+MK+MC+AS	42	51	-40	-51	39	49
NO+VE+AS	35	44	-37	-49	32	41
AR+VE+AS	40	45	-39	-45	40	46
WK+AR	44*	55	-42	-55	46*	55
WK+MC+AS	35	40	-33	-37	29	35
WK+NO+CS	26	45	-28	-52	28	41
AR+MC	43	51	-42	-50	29	35
CS+VE+AR	39*	49	-38	-55	43**	51
MK+EI+AS	40	45	-38	-43	36	41
AR+MK+MC	44	53	-42	-53	36	42
AR+EI+MC	45*	52	-45	-51	32	38
VE+MK	40	49	-37	-51	47*	56
MK+EI	44	52	-42	-51	41	47
MK+MC+EI	43	51	-42	-49	34	41
AR+MK	43	53	-41	-53	42	47
AR+EI+GS	45*	54	-45	-54	41	48
AR+MK+AS	42	49	-39	-47	39	44
MC+MK+AS	38	43	-36	-41	30	35

Note. Decimals have been omitted. Coefficients marked with asterisks are significantly higher than those obtained for the operational JO selector composite (CLER): *$p < .05$; **$p < .01$.

Table 5

Multiple Correlations of Selector Composites and the EDT With Three School Performance Criteria

	FSG (N = 114)			CLSTAND (N = 113)			GRAD/DROP (N = 154)		
Composite	R	R^2	R^2 Change	R	R^2	R^2 Change	R	R^2	R^2 Change
GT	.461	.212		.422	.178		.482	.233	
GT, EDT	.507	.257	.045*	.443	.196	.018	.518	.269	.036**
CLER	.234	.055		.299	.090		.299	.089	
CLER, EDT	.466	.217	.162**	.427	.182	.092**	.478	.229	.140**
ST	.401	.161		.372	.138		.423	.179	
ST, EDT	.487	.237	.076**	.421	.177	.039*	.488	.238	.059**

*p < .05
**p < .01

Table 6

Multiple Correlations of General Technical Composite (GT)
And Most Valid ASVAB Tests for Predicting
School Performance Criteria

ASVAB Composite or Test	R	R^2	R^2 Change
	FSG (N = 137)		
GT	.432	.186	
GT,EI	.466	.217	.031*
GT,EI,NO	.489	.239	.022*
	CLSTAND (N = 136)		
GT	.424	.180	
GT,NO	.479	.230	.050**
GT,NO,EI	.514	.264	.034*
	GRAD/DROP (N = 179)		
GT	.454	.206	
GT,MC	.473	.224	.018*
GT,MC,GS	.493	.243	.019*

* < .05
** < .01

Table 7

Correlations of Promising Alternate ASVAB Composites With School Performance Criteria

ASVAB Composite	FSG (N = 138)		CLSTAND (N = 137)		GRAD/DROP (N = 179)	
	r_u	r_c	r_u	r_c	r_u	r_c
GT (VE+AR)	43	52	-42	-55	45	54
VE+AR+EI	47	54	-47	-55	44	53
VE+AR+EI+NO	49	58	-51	-64	42	51
VE+AR+NO	46	55	-48	-62	41	48
VE+AR+MC	43	52	-42	-53	36	45
VE+AR+MC+GS	43	52	-43	-53	38	47

Note. Decimals have been omitted.

Table 8

Expectancy Analysis for Clerical (CLER) and General Technical (GT) Composites (N = 137 graduates, 42 academic drops, 179 total)

Selector Cutting Score	Grad N	Acad Drop N	Total N	Grad %	Acad Drop %	At or Above Cut Score in Recruit Population %	Expectancies Per 1000 in Population		
							Total	Grad	Acad Drop
Operational Selector: CLER									
≥ 160	136	40	176	77	23	49	490	377	113
≥ 165[a]	134	39	173	77	23	38	380	293	87
≥ 170	121	26	147	82	18	27	270	221	49
≥ 175	93	20	113	82	18	18	180	148	32
≥ 180	57	8	65	88	12	10	100	88	12
≥ 185	29	2	31	94	6	5	50	47	3
≥ 190	16	1	17	94	6	2	20	19	1
Proposed Selector: GT									
≥ 107	118	17	135	87	13	50	500	435	65
≥ 112[a]	101	12	113	89	11	37	370	329	41
≥ 116	85	6	91	93	7	27	270	251	19
≥ 120	68	3	71	96	4	17	170	163	7
≥ 123	49	2	51	96	4	11	110	106	4
≥ 126	29	2	31	94	6	6	60	56	4
≥ 129	15	1	16	94	6	2	20	19	1

[a]Operational (CLER) or proposed (GT) cutting score.

DISCUSSION AND CONCLUSIONS

In general, the results of this research were consistent with those obtained by Parks et al. (1983), and essentially constitute a cross-validation of their findings. The present results show that the GT composite, which has been proposed as the new Navy JO school selector, predicts performance in JO school better than the currently used CLER composite.

The EDT appears to predict JO school performance moderately well: better than the CLER composite and about the same at the GT composite. For all three school performance measures, the EDT substantially (and significantly) increases the validity of the clerical and the skilled technical composites. It does not, however, add significantly to the validity of the GT composite for predicting CLSTAND, and it makes only small additions to the validity for predicting FSG and CLSTAND. These latter increases in explained variance were found to be statistically significant, but they are modest in magnitude and of dubious practical significance (the increases to the multiple correlation coefficients were about .04 correlation points).

Because of the time and expense that would be associated with adding the administration of EDT to the Navy enlisted classification procedures, use of the EDT for classification purposes could only be justified if very large increases in prediction of school success were associated with it. The increases found in this study appear too small to justify the addition of the EDT to the JO school selection criteria.

The regression analyses showed that for FSG and CLSTAND, adding the EI and NO tests to the GT composite significantly increases the validity; similarly for GRAD/DROP, adding the MC and GS tests significantly increases the validity. However, when these tests are combined with the those that comprise the GT composite (VE and AR) to form unit-weighted composites, and these composites are correlated with the criteria, the resulting validity correlations are not significantly higher than those of the GT composite. This result argues against the utility of adding these ASVAB tests to the GT selector composite.

Because attrition is a particular problem in the JO school, the results of the expectancy analyses, which used attrition (GRAD/DROP) as the criterion, are of special interest. These results clearly showed that use of the proposed GT composite would substantially reduce academic attrition, from the current rate of 23 percent down to 11 percent. They also indicated that, although the academic attrition rate could be lowered to 12 percent by raising the cutting score of the operational CLER composite, this approach would not be feasible due to the drastic reduction in potential school admissions--from 37 percent down to 10 percent--that would result.

RECOMMENDATIONS

1. The ASVAB general technical composite (VE + AR), rather than the currently used clerical composite (VE + NO + CS), should be used to select Navy students for Basic Journalist (JO) school.

2. The English Diagnostic Test (EDT) should not be added to the Navy JO school selection criteria.

REFERENCES

Booth-Kewley, S. (1984). Validation of the Armed Services Vocational Aptitude Battery (ASVAB): Selection criteria for the Strategic Weapons Systems Electronics "A" school (NPRDC Tech. Rep. 84-22). San Diego: Navy Personnel Research and Development Center.

Booth-Kewley, S. (1984). Validation of the Armed Services Vocational Aptitude Battery (ASVAB) in Cryptologic Technician Technical (CTT) "A" school (MPL Tech. Note 84-1). San Diego: Manpower and Personnel Laboratory, Navy Personnel Research and Development Center.

Booth-Kewley, S. (1984). Validation of the Armed Services Vocational Aptitude Battery (ASVAB) in Cryptologic Technician Collection (CTR) "A" school (MPL Tech. Note 84-2). San Diego: Manpower and Personnel Laboratory, Navy Personnel Research and Development Center.

Cohen, J., and Cohen, P. (1975). Applied multiple regression/correlation analyses for the behavioral sciences. Hillsdale, New Jersey: L. Erlbaum Assoc.

Lawley, D. (1943-44). A note on Karl Pearson's selection formulae. Royal Society of Edinburgh, Proceedings, Section A, 62, 28-30.

Park, R. K., Mathews, J. and Ree, M. J. (August 1983). Validation of the English Diagnostic Test for journalism related programs (Unpublished letter report.) San Antonio, Texas: Air Force Human Resources Laboratory.

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS
2a SECURITY CLASSIFICATION AUTHORITY	3 DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited.
2b DECLASSIFICATION/DOWNGRADING SCHEDULE	
4 PERFORMING ORGANIZATION REPORT NUMBER(S) MPL TN 84-3	5 MONITORING ORGANIZATION REPORT NUMBER(S)
6a NAME OF PERFORMING ORGANIZATION Navy Personnel Research and Development Center--Manpower and Personnel Laboratory 6b OFFICE SYMBOL (If applicable) 06	7a NAME OF MONITORING ORGANIZATION
6c ADDRESS (City, State and ZIP Code) San Diego, California 92152	7b ADDRESS (City, State and ZIP Code)
8a NAME OF FUNDING/SPONSORING ORGANIZATION Chief of Naval Operations Enlisted Programs Implemen-Branch 8b OFFICE SYMBOL (If applicable) Op-135L	9 PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c ADDRESS (City, State and ZIP Code) Washington, DC 20350	10 SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO: / PROJECT NO: / TASK NO: / WORK UNIT NO: WRB2708

11 TITLE (Include Security Classification)
Validation of the Armed Services Vocational Aptitude Battery (ASVAB) and the English Diagnostic Test (EDT) for Performance in Basic Journalist (JO) School

12 PERSONAL AUTHOR(S)
Booth-Kewley, Stephanie

13a TYPE OF REPORT	13b TIME COVERED	14 DATE OF REPORT (Year, Month, Day)	15 PAGE COUNT
Final	FROM 10/80 TO 12/83	September 1984	30

16 SUPPLEMENTARY NOTATION

17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Armed Services Vocational Aptitude Battery (ASVAB); test validation; Basic Journalist School; predictive validation
05	09		

19 ABSTRACT (Continue on reverse if necessary and identify by block number)

This research evaluated the Armed Services Vocational Aptitude Battery (ASVAB) clerical composite, which is used to determine qualification of Navy recruits for Basic Journalist (JO) "A" school. The research also evaluated the contribution of the English Diagnostic Test (EDT) to the ASVAB selection criteria. Correlational and expectancy analyses indicated that the ASVAB general technical composite predicts performance in JO school better than does the clerical composite. The EDT makes a small but significant contribution to the validity of the ASVAB general technical composite.

20 DISTRIBUTION/AVAILABILITY OF ABSTRACT	21 ABSTRACT SECURITY CLASSIFICATION	
[X] UNCLASSIFIED/UNLIMITED [ ] SAME AS RPT [ ] DTIC USERS	UNCLASSIFIED	
22a NAME OF RESPONSIBLE INDIVIDUAL Stephanie Booth-Kewley	22b TELEPHONE (Include Area Code) (619) 225-2181	22c OFFICE SYMBOL 62

DD FORM 1473, 84 JAN

83 APR EDITION MAY BE USED UNTIL EXHAUSTED
ALL OTHER EDITIONS ARE OBSOLETE

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE